

What is claimed is:

1. A hydraulic tensioner for imparting tension to a chain comprising:

a housing having a retraction blocking member opening extending into a piston hole in an interior of the housing;

a hollow piston that is axially slidable in the piston hole, the piston having an inside space that forms a fluid chamber with the piston hole, the piston comprising a plurality of rack teeth on at least a portion of an outer circumference of the piston;

a piston spring provided in the piston hole, wherein the piston spring urges the piston in an extending direction;

a retraction blocking member located in the retraction blocking member opening and disposed adjacent to the rack teeth of the piston, the retraction blocking member comprising a teeth portion engageable with the rack teeth of the piston and adapted to permit movement of the piston in the extending direction but to prevent movement in a retracting direction; and

a retraction blocking member spring urging the teeth portion to engage with the rack teeth;

wherein the retraction blocking member has a width greater than that of a tip portion of the rack teeth of the piston.

2. The hydraulic tensioner of claim 1:

wherein the retraction blocking member opening comprises a pawl hole;

wherein the retraction blocking member comprises a pawl member provided in the pawl hole, wherein there is an axial clearance between the pawl hole and the pawl member;

6 wherein the retraction blocking member spring comprises a pawl spring;  
7 and

8 wherein the width of the retraction blocking member comprises a width of  
9 the pawl member.

1 3. The hydraulic tensioner of claim 1, wherein the retraction blocking member has a  
2 width greater than that of a bottom portion of the rack teeth of the piston.

1 4. The hydraulic tensioner of claim 1, wherein the retraction blocking member has a  
2 width greater than that of an outer diameter of the piston.

1 5. The hydraulic tensioner of claim 1, wherein the retraction blocking member spring  
2 comprises at least one U-shaped bent portion symmetrically disposed about an  
3 axial centerline of the piston, the bent portion contacting a back surface of the  
4 retraction blocking member.

1 6. The hydraulic tensioner of claim 5, wherein the U-shaped bent portion is formed by  
2 bending a band-shaped sheet of metal.

1 7. The hydraulic tensioner of claim 1, wherein the retraction blocking member spring  
2 comprises two U-shaped bent portions which form a W-shaped bent portion,  
3 wherein each U-shaped portion is symmetrically disposed about an axial centerline  
4 of the piston, the bent portion contacting a back surface of the retraction blocking  
5 member.

1 8. The hydraulic tensioner of claim 1, wherein the retraction blocking member spring  
2 comprises at least one U-shaped bent portion and the retraction blocking member  
3 comprises at least one axially extending groove on a back surface thereof, such that  
4 the U-shaped bent portion of the retraction blocking member spring engages the  
5 groove.

1 9. The hydraulic tensioner of claim 8, wherein the U-shaped bent portion is formed by  
2 bending a band-shaped sheet of metal.

- 1 10. The hydraulic tensioner of claim 1, wherein the hydraulic tensioner further comprises  
2 a pair of engagement recesses and the retraction blocking member spring  
3 comprises a pair of engaging hooks on opposite ends thereof such that the  
4 engaging hooks of the retraction blocking member spring engage the engagement  
5 recesses.
- 1 11. The hydraulic tensioner of claim 1, wherein the housing comprises a check valve at a  
2 bottom portion of the piston hole, wherein the check valve permits fluid flow into  
3 the fluid chamber but blocks reverse flow out of the fluid chamber.
- 1 12. The hydraulic tensioner of claim 1, wherein the housing comprises a material having a  
2 hardness lower than a hardness of a material that comprises the retraction blocking  
3 member.
- 1 13. The hydraulic tensioner of claim 1, wherein the housing is composed of aluminum.
- 1 14. The hydraulic tensioner of claim 1, wherein the retraction blocking member comprises  
2 a front end surface and a rear end surface, and the retraction blocking member  
3 opening comprises a retraction blocking member opening surface such that the  
4 front end surface or the rear end surface of the retraction blocking member contacts  
5 the retraction blocking member opening surface when the retraction blocking  
6 member extends or retracts.
- 1 15. The hydraulic tensioner of claim 1, wherein the retraction blocking member opening  
2 comprises a retainer hole radially penetrating into the piston hole, and the  
3 retraction blocking member comprises:  
4 a pawl member located in the retainer hole and disposed adjacent to the  
5 rack teeth of the piston, wherein the pawl member comprises the  
6 teeth portion engageable with the rack teeth of the piston; and  
7 a pawl retainer mounted on the retainer hole and having a pawl housing  
8 hole for housing the pawl member;  
9 wherein the retraction blocking member spring comprises a pawl spring;  
10 and

11                wherein a width of an attachment surface of the pawl retainer relative to the  
12                retainer hole is the retraction blocking member width.

1        16. The hydraulic tensioner of claim 15, wherein the housing further comprises a  
2                counterbore at an opening end of the piston hole, the counterbore having a greater  
3                diameter than a diameter of the piston hole, and wherein the pawl retainer  
4                comprises a lower elongated end disposed in a vicinity of the rack teeth of the  
5                piston, such that the lower elongated end of the pawl retainer prevents the piston  
6                from rotating.